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**Statement of
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before the
Subcommittee on Space, Aeronautics, and Related Sciences
Committee on Commerce, Science and Transportation
United States Senate**

Mr. Chairman and Members of the Subcommittee, thank you for the opportunity to appear before you today to discuss NASA's efforts as we prepare for the Space Shuttle's retirement and work to develop the new human space exploration vehicles. This "transition" provides us with a unique opportunity to reinvent and revitalize NASA's human spaceflight program and make it more efficient by focusing on the evolution of our skilled workers and our facilities and infrastructure. Never in the almost 50-year history of the Agency has a task of this magnitude been undertaken. The kind of sweeping changes that this transition will bring can be daunting. But what I tell my workforce, and what I truly believe, is this: "We are not going out of business; we are starting a new business." We have the unique opportunity to be performing the most complicated space assembly activities ever attempted, preparing the International Space Station (ISS) to become a National Laboratory, and developing the systems that will be used for human exploration of the solar system. These activities will require us all to work together and provide leadership and focus, as many activities compete with each other for time and resources. Performing these activities successfully will inspire the next generation and maintain our world leadership role in space. This is a great time to be in the space business.

For the next four years, NASA's top priority is to safely fly the remaining Shuttle flights to complete assembly of the International Space Station (ISS). At the same time, the Agency is preparing to bring the new U.S. human spaceflight capabilities on-line soon thereafter. With the retirement of the Shuttle in 2010, NASA will fundamentally shift from the current primary focus on operations to one in which we develop new systems, conduct research on the ISS, and re-establish the capability for space exploration missions beyond low Earth orbit, with the ultimate goal of returning to the Moon, going to Mars and beyond. These are significant challenges, and we need help from Congress to succeed, specifically by supporting the Vision for Space Exploration, approving the President's FY 2008 budget for NASA at the requested levels and approving the workforce transition and facilities management tools in the legislative proposal that NASA recently submitted to Congress. I appreciate the leadership of this Subcommittee and the Congress in enacting the NASA Authorization Act of 2005 (P.L. 109-155); this legislation is a good example of the support that you have already provided.

An effective transition of workforce, facilities, and contractor support from the Space Shuttle program to the new Constellation program will be jeopardized by a prolonged gap between Shuttle operations and the Initial Operating Capability of Orion and Ares, such as the gap which developed between the Apollo-Soyuz program and the maiden flight of the Space Shuttle. Our job as a leadership team is to actively manage the gap, ensure that our workforce skills are rebalanced to meet the evolved focus of the Agency, and effectively communicate our actions and goals to all of our stakeholders, most importantly our employees.

Funding limitations and hardware development lead times will not allow us to overlap Shuttle and Constellation capabilities. We know there will be a gap -- our job is to keep this gap to a minimum, and with your help, this can be accomplished. I am often asked why NASA does not just extend the Shuttle program to close the gap. The primary reason I give is that the high fixed costs of the Shuttle program do not allow that strategy to work. Extending the Shuttle program a year would cost approximately \$3-4 billion per year. These funds would come from Constellation development and, consequently, would only extend the gap. Another reason is that the Shuttle is an extremely complicated vehicle to operate. Many systems interact with others. Consider the interaction of foam from the tank on the Shuttle as an example. Safely operating this complex vehicle is not easy. NASA has chosen to use the Shuttle with this safety complexity for only those missions requiring the Shuttle's unique capabilities. The assembly of the ISS, Hubble Space Telescope servicing mission, and ISS spares carried on the logistics flights all require the unique capability of the Shuttle. Once these missions are complete, NASA needs to transition to the simpler and safer Orion Crew Exploration Vehicle (CEV) as soon as feasible. We believe that human spaceflight is a strategic capability for this Nation, and we recognize the important role NASA plays in ensuring the U.S. maintains this capability.

Transition starts with phasing out the Space Shuttle and bringing CEV online, continues with the research and testing that will take place on the ISS as part of a National Laboratory, and includes using the Commercial Orbital Transportation Services (COTS) program to demonstrate new capabilities for re-supply. As the Shuttle approaches its retirement, the ISS Program intends to use alternative cargo and crew transportation services from commercial industry. Once a capability is demonstrated in Phase 1 of the Commercial Orbital Transportation Services (COTS) Space Act Agreements, NASA plans to purchase cargo delivery services competitively in Phase 2 and will decide whether to pursue crew demonstrations. NASA will be in an almost continual state of transition as development of one phase of exploration transitions from development to operations. Consequently, what we are establishing now is a transition framework that will serve us through the decades ahead. NASA chose not to create a separate program to manage transition, but instead utilize organizational elements within the existing operating program and the future exploration program. This structure ties transition directly to the safe operation of our programs and allows for a framework for transition to be established within NASA.

The goal of transition is to keep the U.S. space workforce fully engaged and moving toward design and development of the new vehicles. Our focus is on life cycle cost and risk management of our workforce, infrastructure, and facilities, including the necessary budget and plans to execute the ambitious agenda at hand. Full funding of NASA's FY 2008 budget request is critical to ensuring the gap between retirement of the Space Shuttle and America's new human spaceflight capability does not grow longer. If the gap in our human spaceflight capability

extends even further than already planned, I believe our Nation may be ceding leadership in human spaceflight at a time when other nations are outlining ambitious programs of their own.

NASA's transition planning activities emphasize three major themes: 1) safely flying out the Shuttle manifest; 2) closing out and streamlining our facilities and infrastructure; and 3) reorienting our workforce for future missions. We are heading in the right direction and have a robust plan in place with the right people to execute it. We have made great strides this past year and will maintain this momentum as we continue to make substantial and rapid progress in carrying out the challenging space operations and transition tasks ahead.

1. Safely Flying Out the Shuttle Manifest

While we look toward the future, we know we cannot lose sight of the present. NASA is committed to safely flying the Shuttle through its retirement in 2010 to complete construction of the ISS, which will fulfill our commitments to our International Partners and enable us to conduct exploration-focused research onboard. While there are challenges ahead, we have a good, sound plan that places safety above all else. As evidenced by the recent hail storm that caused damage to the STS-117 External Tank, that plan may not go exactly the way we have laid out, but we are prepared to continue working through it and to adjust as needed. We will learn from these challenges and gain experience necessary for future ventures to the Moon and Mars.

The Shuttle manifest calls for 13 assembly flights to the ISS, one to service the Hubble Space Telescope. In addition, we could potentially add two ISS logistics flights to the manifest if they are needed and can be flown safely before the Shuttle's 2010 retirement. In order to safely complete these missions, retention of our workforce, with their skills and tremendous dedication, is critical. A recent survey of Shuttle personnel across the NASA field Centers clearly demonstrates that we have highly-motivated people who want to stay for the remainder of the program and see it succeed. As an Agency, we share their pride in the program's accomplishments and are heartened by their commitment to safety and mission success. As leaders we contribute to this success by showing through our actions a strong commitment to these activities, as well as the promise of exciting future endeavors.

2. Infrastructure and Facilities

The Shuttle program currently occupies over 600 facilities at both government and contractor sites and has more than 900,000 pieces of equipment. The estimated new acquisition value of these assets is approximately \$12 billion for equipment and approximately \$5.7 billion for facilities. This is a vast amount of resources that the American people have invested in and entrusted us with. We are committed to leveraging this investment by utilizing Shuttle infrastructure wherever it makes sense in the Constellation programs. We have already made progress in this respect. At NASA's Kennedy Space Center in Florida, the Space Shuttle program has transitioned Firing Room 1 and the Operations and Checkout Building to Constellation. Work is also underway to transition Launch Complex 39B to eventually launch Ares and Orion. At Stennis Space Center in Mississippi, the A1 Rocket Test Stand, formerly

used to test the Space Shuttle Main Engine, is now testing engines for Constellation. And at Johnson Space Center, key leaders in the ISS program have transitioned to senior management positions in Exploration, bringing with them their technical and programmatic expertise.

Since our new spacecraft designs are Shuttle-derived, we can build on the existing infrastructure across the Agency. However, many of our key facilities and infrastructure elements are almost 50 years old in areas prone to aggressive climate impacts and heavy operational demands. As the transition to the next U.S. human spaceflight capability progresses, we have the opportunity to streamline all aspects of our business and provide more value to the American people. We also are assessing our infrastructure to ensure that we have the necessary foundation for the next 30 years of exploration activities.

3. Workforce

Guiding the Agency's transition is the recognition of the critical role played by our approximately 17,000-strong workforce. As the Associate Administrator for Exploration Systems Scott Horowitz likes to say, "When folks ask me how we go into space, they expect me to say 'Rockets and hardware,' but I think people make the Space Shuttle fly not hardware." The men and women who work in the Space Shuttle program are some of the Nation's most skilled, efficient, and committed workers – qualities that the Agency and Nation needs for its future missions and must capitalize upon.

As mentioned earlier, the nature of the work these employees will do will change as we transition from Shuttle operations to research and development-focused activities like planning, design, testing and verification for Constellation systems. We are striving to give our employees opportunities to build on their existing skills by working on the new exploration systems, so that when this development work comes on-line, they can easily transition into new positions. Coupled with newly gained skills, our workforce can take the skills honed in Shuttle operations and apply them to the design of the next vehicle to make it fly more efficiently. Preventing a prolonged gap between the last Shuttle flight and the first Orion flight remains the single most important factor in workforce transition. The longer the gap, the more difficult it becomes to retain our needed workforce.

As the Constellation System Requirements Reviews are completed this year, NASA will gain a much clearer understanding of the demands for future workforce skills, which will form the foundation for making any future decisions. Although we are proud of recent progress, we acknowledge that more needs to be accomplished. These tasks include matching available skills with future work, managing attrition, retraining and hiring, and using temporary and term appointments to get the flexibility to align our needs with our time-phased workload.

NASA remains committed to working with our industry, supplier, and research partners to craft and implement strategies to minimize disruption, upheaval, and economic impact, while maximizing support vital for Shuttle missions and program requirements. As we move forward, we know that clear communication and solid leadership will be key to our success. I cannot stress one point enough - NASA recognizes and values the dedication of its Shuttle workforce.

The Agency in return is dedicated to ensuring that those men and women have challenging future work that capitalizes on their unique skills and abilities. Make no mistake there will be changes for our workforce, but if we provide leadership and focus, I am confident that this team will respond. They have overcome difficult challenges in the past: Katrina, hail storms, and the Columbia disaster. If we can give them a vision of the future, they will help us to realize that future. This is the best workforce in the world.

Conclusion

NASA has many transition challenges ahead of us, but we are on track and making substantial progress in managing a fundamental shift from operating spacecraft in orbit around the Earth to cutting-edge research and development for space exploration that will push humanity out of low-Earth orbit and across the solar system. This is an exciting time for NASA and the Nation.

We need your continued support to accomplish this endeavor and to ensure that the United States maintains its status as the world leader in human space exploration. Thank you for the opportunity to discuss this important effort, and I would be pleased to respond to any questions that you may have.